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山西垣曲盆地中始新世的原翼齿兽(鬣齿兽科,肉齿目,哺乳纲)化石[1)]

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摘要　记述了在山西省垣曲县王茅乡郭家村火石坡地点发现的原翼齿兽属一新种——童氏原翼齿兽(*Propterodon tongi* sp.nov.)。新种比伊尔丁原翼齿兽(*P. irdinensis*)个体小、下颌联合部靠前、下前臼齿之间有齿隙、m3跟座小。新材料为垣曲盆地可能存在中始新世伊尔丁曼哈期地层提供了证据。

关键词　山西垣曲,中始新世,原翼齿兽

中图法分类号　Q915.873

近年来,我们在山西省垣曲县王茅乡郭家村找到了一个新化石点——火石坡,该地点产有较为丰富的哺乳动物化石(黄学诗等,1999;2001)。本文报道的是其中的肉齿目化石。

肉齿目　Creodonta Cope,1875

鬣齿兽科　Hyaenodontidae Leidy,1869

原翼齿兽属　*Propterodon* Martin,1906

童氏原翼齿兽　*Propterodon tongi* sp.nov.

(图1)

Propterodon irdinensis Matthew et Granger,1925,Huang et al.,2001,91,96

正型标本　一左下颌骨带颊齿 p1～m3(V 12612)。

产地及层位　山西省垣曲县王茅乡郭家村火石坡,中始新世伊尔丁曼哈期(?)河堤组峪里段。

特征　一种比伊尔丁原翼齿兽个体稍小、下颌联合部稍靠前、下前臼齿之间有齿隙、m3跟座极度退化的原翼齿兽。

词义　种名赠给我国著名的古脊椎动物学家童永生教授,他在肉齿类的研究及垣曲盆地的地层古生物工作中均作出了重大贡献。

记述　下颌骨水平支比较细长、平直,在p3之前变浅且向上翘起,但在m3处底缘不收缩(表1)。下颌联合达p3前缘。颏孔两个,均比较大,分别位于p1和p3之下骨体中部。前颏孔较圆,直径约为2.5mm,后颏孔呈椭圆形,前后径大,约为3.5mm。咬肌窝深,咬肌脊明显,前缘位于下颌上升支前缘之下,与m3后缘约有5mm之距。

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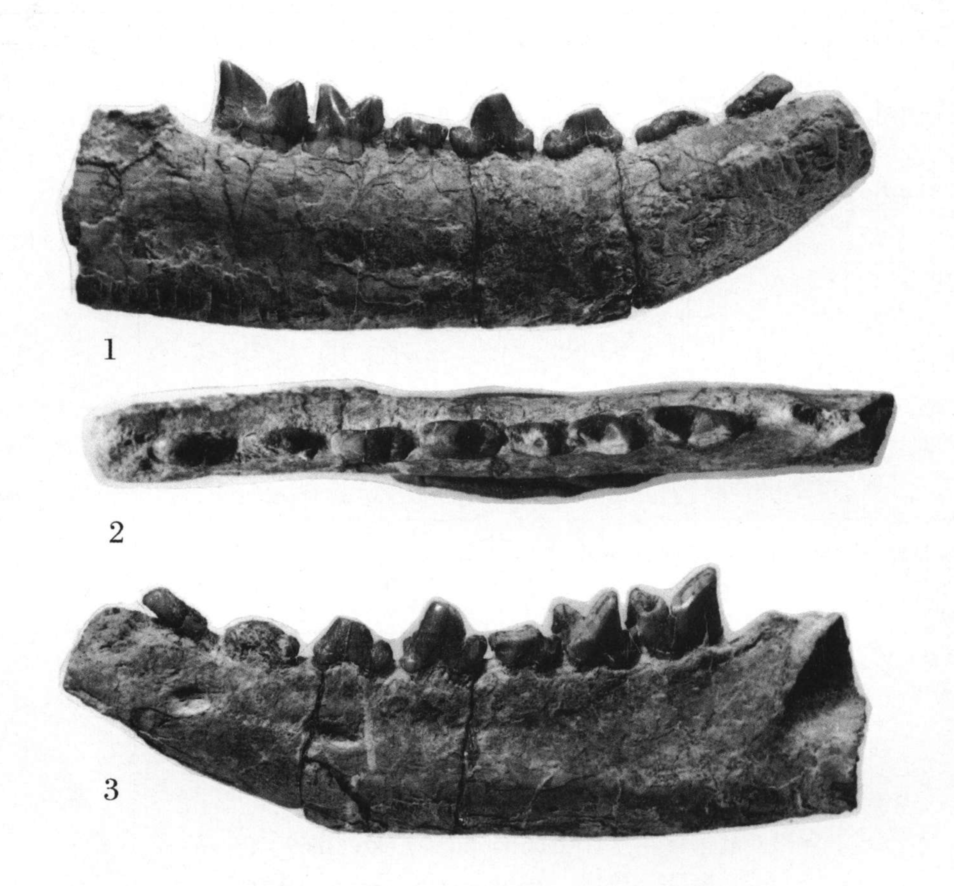


图1 童氏原翼齿兽(新种)的左下颌骨附颊齿 p1～m3(V 12612)
Fig.1 The left lower jaw with p1～m3 (V 12612) of *Propterodon tongi* sp. nov. ×1.5
1 舌面观 lingual view; 2 冠面观 crown view; 3 唇面观 labial view

表1 童氏原翼齿兽下颌骨体(V 12612)深度测量

Table 1 Measurements of the horizontal ramus' depth (V 12612) of *Propterodon tongi* sp. nov.

(mm)

	p1之下(under p1)	p4之下(under p4)	m3之下(under m3)
唇面(labial)	10.0	14.6	15.6
舌面(lingual)	11.0	15.0	15.9

下前臼齿相对比较大,之间有齿隙,主尖不向后倾。

p1 单齿根,齿冠向前匍匐成豆状,主尖十分靠前且很低。

p2 齿冠前外侧已破损。后基尖(posterobasal cusp)低弱。与 p1 和 p3 间分别约有 1.5 和 1.0mm 的齿隙。双齿根。

p3 主尖高大,位于牙齿中部,顶端不向后倾。无前基尖(anterobasal cusp)。后基尖很粗大,与主尖之间有较明显的切迹。与 p4 间约有 0.5mm 的齿隙。

p4 在形态上与 p3 相似,只主尖更高大,后基尖更粗壮,并有微弱的前基尖。

下臼齿排列紧密无齿隙,并多少有点成镶嵌状态。从 m1 到 m3 尺寸渐趋增大,但跟座明显退化。

m1 比前后两牙齿均小(表 2)。三角座已破损,但仍可分辨出下前尖和下原尖的位置,似与 m2 同。跟座与三角座宽度相近,具有相当大而高的脊,此脊呈纵向,位于牙齿中部。

m2 保存完好。下前尖和下原尖均很粗大,后者略高,之间有切迹。无下后尖。跟座虽不如在 m1 中大,但其上的脊仍很发育。

m3 为裂齿,下前尖和下原尖更加高大,尤其是后者,它们几乎成为牙齿的全部。两尖之间的切迹比在 m2 中深狭。跟座十分小而微弱,唇侧视几乎见不到。

m2 和 m3 的外侧见有明显的剪切面。该标本代表的是成年个体。

表 2　童氏原翼齿兽的下颊齿(V 12612)测量

Table 2　Measurements of the lower cheek teeth (V 12612) of *Propterodon tongi* sp. nov.　(mm)

	p1	p2	p3	p4	m1	m2	m3	p1 ~ m3	p1 ~ p4	m1 ~ m3
长(length)	6.5	7.0	7.2	8.0	6.5*	7.9	8.9	51.5	31.5	21.5
宽(width)	3.0	3.2*	3.5	3.6	3.3*	3.5	4.2			

* 为近似值。

比较与讨论　该标本下颊齿基本上是尖形齿,但比较粗钝,m3 发育成裂齿,因此它属于肉齿目裂齿兽科无疑。它与该科中的翼齿兽(*Pterodon*)、鬣齿兽(*Hyaenodon*)和原翼齿兽(*Propterodon*)等属最接近。但有些特点,尤其是 m3 具小的跟座,与无跟座的鬣齿兽很不相同。就 m3 跟座而言,它又比翼齿兽属的 m3 跟座小得多。在这点上,它很接近原翼齿兽。原翼齿兽的属名来源历史很复杂(童永生等,1986),但它仍是个有效的属(McKenna and Bell, 1997)。垣曲标本与河南淅川核桃园组中发现的皮石沟原翼齿兽(? *Propterodon pishigouensis*)的区别主要是 p4 顶端不向后倾,m1 相对显得小。而后者 p4 的顶端明显后倾,m1 长度接近 p4(童永生等,1986)。产在核桃园组中的另一种原翼齿兽(*Propterodon* sp.)的 m1 和 m2 有明显的下后尖(高玉,1976;童永生等,1986),与无下后尖的垣曲标本根本不同。垣曲标本与发现在内蒙古的伊尔丁原翼齿兽(*P. irdinensis* Matthew and Granger, 1925;有人认为该种与 *Paracynohyaenodon morrisi* Matthew and Granger, 1924 为同物异名,遂改属种名为 *Propterodon morrisi*——见 Dashzeveg, 1985;童永生等,1986)倒很相似,这主要表现在:1) 个体大小接近;2) 两个颏孔的位置相同,分别位于 p1 和 p3 之下;3) 下前臼齿大(表 2),顶端不向后倾;4) m3 跟座小,下原尖宽,后侧平坦(即无棱);5) m1 跟座具有大而高的脊;6) p3 无前基尖,p1 单根。但新标本与伊尔丁原翼齿兽的正型标本(AMNH No. 20128)尚存在些差异:1) 个体更小,p1 ~ m3 长度约与后者正型标本 p1 ~ m2 接近;2) 下颌联合部靠前,后缘位于 p3 前缘;3) 下前臼齿不紧密排列,在 p1 与 p2、p2 与 p3 之间均有小的齿隙;4) m3 跟座更小。

本文记述的标本无法与发现在河南卢氏组中的伊尔丁原翼齿兽标本直接对比,那是一件带有 P4 的上颌骨(周明镇,1975)。

伊尔丁原翼齿兽正型标本是该属中以往发现的最好材料,但它只保存了 p3、m1 和 m3 三个颊齿,其余 p1、p2、p4 和 m2 都是想像画出的。从新标本看,Matthew 和 Granger(1925)

所绘的p4和m2形态与大小与新标本基本一致。p1和p2尤其是p1出入就大了。新标本p1是个向前匍匐的牙齿，主尖低而靠前，呈豆状。而在Matthew和Granger(1925)图中p1和p2主尖明显偏高，p2的后基尖也显得大。垣曲标本这些特点是代表属的特征，还是与伊尔丁种的差别，目前还难以断定。

垣曲盆地郭家庄火石坡是近几年来新发现的化石点，所产化石如李氏戈壁兔(*Gobiolagus lii* Zhang et al.,2001)、原始啮齿类和某些奇蹄类等均说明其地质时代有可能是中始新世伊尔丁曼哈期，但有些化石如始爪兽过去仅在沙拉木伦期中发现过(Zdansky,1930)，食肉类细齿兽又是个新种(黄学诗等,1999)，因此有关化石点的地层时代尚难定论。新种童氏原翼齿兽与伊尔丁原翼齿兽在进化水平上大致相当，因此它在该点的出现，无疑为垣曲盆地可能存在伊尔丁曼哈期地层增加了证据。

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PROPTERODON (HYAENODONTIDAE, CREODONTA, MAMMALIA) FROM THE MIDDLE EOCENE OF YUANQU BASIN, SHANXI PROVINCE

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Key words Yuanqu, Shanxi, Middle Eocene, *Propterodon*

Summary

Many Middle Eocene mammalian fossils were found in Huoshipo, Yuanqu Basin, Shanxi Province in recent years (Huang et al., 1999; 2001). Among these, *Propterodon* remain of Creodonta is reported in the present paper.

Creodonta Cope, 1875

Hyaenodontidae Leidy, 1869

***Propterodon* Martin, 1906**

***Propterodon tongi* sp. nov.**

(Fig. 1)

Type A left lower jaw with p1 ~ m3 (V 12612).

Locality and horizon Huoshipo, Guojia Village, Wangmao Town, Yuanqu County, Shanxi Province; Middle Eocene Yuli Member of Hedi Formation.

Diagnosis A species of *Propterodon* similar to *P. indinensis* in main tooth morphology, but differs mainly in having smaller size, diastema among the lower premolars and much smaller talonid of m3.

Etymology Trivial name for Professor Tong Yongsheng who made great contributions to the study of Chinese creodont fossils and to the work of stratigraphy and paleontology in Yuanqu Basin.

Description The horizontal ramus is elongate and straight. The mamdibular symphysis reaches anterior to p3. There are two mental foramens, situated beneath p1 and p3, respectively. The

masseteric fossa is deep, with distinct masseteric crest terminating below the anterior part of the vertical ramus anteriorly, about 5mm posterior to m3.

The lower premolars are large and the main cusps do not tilt backwards.

p1 lower-crowned and single-rooted. The crown crawls forwards like a bean. The main cusp is low and more anteriorly situated.

p2 crown was damaged anteroexternally. The posterobasal cusp is low and weak. There is 1.5mm diastema between p1 and p2, and 1.0mm between p2 and p3, respectively. This tooth is double-rooted.

p3 and p4 are higher-crowned than the first two premolars. The main cusp is high and big, situated in the center of the tooth, and with the top not tilt posteriorly. p3 has no anterobasal cusp, but the posterior one is very robust. There is about 0.5mm diastema between p3 and p4. p4 is larger and higher than p3, with high main cusp, more robust posterobasal cusp and weak anterior one.

The lower molars arrange closely one another, increase in size from front to rear, but with gradual reduced talonid.

m1 (trigonid damaged) is smaller than the neighboring teeth, but with rather large, high-crested heel nearly as broad as the body of the tooth.

m2 is well-preserved. Both paraconid and protoconid are robust and high. There is no metaconid. The talonid is not as large as in m1 but still distinct.

m3 paraconid, especially protoconid, is higher and bigger than in m2. The talonid is minute, even can not be seen in labial view.

There is distinct wearing face on the external side in m2 and m3.

Remarks The sharp cusp of lower cheek teeth, especially the carnassial m3, indicate the specimen studied should belong to Hyaenodontidae of Creodonta. Among this family Yuanqu specimen is most similar to that of *Pterodon*, *Hyaenodon and Propterodon*. But small talonid of m3 is different fron that of *Hyaenodon* in which talonid of m3 is completely missing. *Pterodon* has much larger talonid of the last lower molar. In this respect the new material resembles that of *Propterodon*. The study history of *Propterodon* is very complicated (Tong and Lei, 1986), but it is still an available genus (McKenna and Bell, 1997). Now there are three or more species in the genus. *Propterodon tongi* sp. nov. differs from? *Propterodon pishigouensis* found from Middle Eocene Hetaoyuan Formation, Xichuan, Henan in having smaller m1 and not backward tilted p4. *Propterodon* sp. reported by Tong and Lei (1986) from the above formation possesses distinct metaconid on m1 and m2, differing from the new species which has no metaconid on the two lower molars. *P. tongi* sp. nov. is most similar to *P. irdinensis* found in Irdin Manha Bed of Nei Mongol (some people considered that *P. irdinensis* was the synonym of *Parahyaenodon morrisi* and changed the species name as *Propterodon morrisi*-Dashzeveg, 1985; Tong and Lei, 1986): 1) size closer; 2) having two same positioned mental foramens (beneath p1 and p3, respectively); 3) larger lower premolars with top not tilted backwards; 4) minute m3 talonid; 5) m1 with rather large high-crested heel; 6) p3 without anterior basal cusp, and p1 single-rooted. But the difference is still big enough to distinguish the two species: The size of *P. tongi* sp. nov. is smaller than that of *P. irdinensis*. The former has diastema among the lower premolars and much smaller talonid of m3 than the latter.

The type of *P. irdinensis* is the best preserved specimen of the genus so far known. But it only preserves p4, m1 and m3. p1 and p2 are low-crowned teeth according to new material. The main cusp is not as high as the type specimen (AMNH no. 20128) of *P. irdinensis* figured by Matthew and Granger (1925). If these are not characteristics of the genus, they are differences of the above two species.

The primitive rodents, lagomorph and certain perissodactyls recovered from Huoshipo locality indicate the fossil-bearing bed is middle Middle Eocene Irdinmanhan in age. Whereas some other fossils, like eomoropid, were found in late Middle Eocene Sharamurunian in the past. *Miacis boqinghensis* has no significance on age determination because it is a new species (Huang et al., 1999).

The discovery of *Propterodon tongi* sp. nov. in Huoshipo provides further evidence that there may be Irdinmanhan deposits in Yuanqu Basin since this species is the nearly same evolutionary level with *P. irdinensis* found in Irdin Manha Bed of Nei Mongol (Matthew and Granger, 1925).

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